



# Perception and use of landscape concepts in the procedure of Environmental Impact Assessment: Case study—Switzerland and Romania



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## ABSTRACT

The European Landscape Convention (ELC) defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”. Because all aspects linked to landscape are evaluated during the Environmental Impact Assessments (EIAs) procedure, we assessed the Swiss and Romanian experts’ perception and EIA reports regarding the landscape concept. Therefore, we analysed Swiss and Romanian experts’ perception of landscape, we evaluated concepts and methods used in environmental impact reports to assess landscape characteristics and functions, and how the ELC’s aim and objectives are reflected by the EIA reports.

The Canonical Correspondence Analysis performed to evaluate the experts’ perception of landscape integration in the EIA procedure showed a significant relationship among pattern of answers and experts’ professional background. Moreover, there is a significant difference between Swiss and Romanian expert’s perception. Longer experience in the field and a higher level of education indicates higher awareness of landscape characteristics and properties, which demonstrates that alongside with the initial training, there is a need for developing a coherent long-life learning systems having landscape analysis as a focus.

The ELC is familiar to nearly 86% of the Romanian Environmental Impact Assessment actors and nearly 29% of the Swiss experts. By contrast, most of the Romanian EIA reports analysed do not employ many concepts of the ELC, while most of the Swiss environmental reports incorporate objectives of landscape protection consistent with the Convention.

Our study relies on the comparative investigation of representative case studies of Environmental Impact Assessment reports for industry, local infrastructures, tourism facilities, and wind farm projects, as well on tracking how the European Landscape Convention is reflected by the EIA reports. We found that EIA reports from both countries evaluate the visual landscape, thus, achieving subjective assessment of landscape aesthetics without focusing on social and ecological sub-systems. Quantitative elements of landscape analysis are mostly absent and it is challenging to evaluate whether environmental assessments are consistent among European Landscape Convention countries.

To overcome the abstract way of evaluation of project’s impact on landscape through EIA procedure, an improved landscape analysis procedure is needed and we propose developing technical guidelines, under the European Landscape Convention umbrella, in order to enhance landscape management.

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## Introduction

The European Landscape Convention (ELC) aims at promoting landscape protection, management and planning, and to organize European co-operation on landscape issues (Council of Europe, 2000). It is the first international agreement which addresses all dimensions of European landscape and interactions between man and nature (Antonson, 2009; Conrad et al., 2012).

To put into action ELC's objectives, European countries should adjust their environmental policies and evaluation methodologies (Roe, 2013). Thus, a review of environmental policies of convention contracting parties may highlight differences among countries and contribute to the redirection of their existing policies (Perkins and Neumayer, 2007; De Montis, 2014). ELC is proving to be challenging to implement due to the complex meaning of the landscape concept (Mikusiński et al., 2014). Landscape is defined as a social-ecological system that incorporates ecological, cultural, and social characteristics (Antonson, 2009). As such, a comprehensive evaluation of landscape requires the participation of experts of different backgrounds (Antonson, 2009; Mikusiński et al., 2014). Currently, landscape research is for the most part quantitative when ecological characteristics are investigated (e.g. Forman, 1995) and qualitative and descriptive when cultural and social characteristics are explored (Antonson, 2011). Thus, the concept of landscape is prone to be perceived differently across the landscape dimensions and individual's background (Mikusiński et al., 2014).

Environmental Impact Assessment (EIA) was developed and introduced in the 1960s as a tool to improve a project's environmental consequences and to engage the public in the project planning process (Kværner et al., 2006). EIAs become a compulsory legal tool for project endorsements worldwide, but with different evaluation requirements (Glasson and Bellanger, 2003; Glasson et al., 2012). Landscape analysis must be part of EIA for all European countries, and ELC has the potential to unify the evaluation methodologies by providing a common definition, protection objectives, and measures (Council of Europe, 2000). To date, this has not been achieved principally due to lack of common evaluation tools or guidelines (Pedroli et al., 2007; Henningsson et al., 2014; Mikusiński et al., 2014). Identifying the projects that may negatively impact a landscape is a challenging task and has been subject to criticism due to the lack of transparency and reproducibility (Lindblom, 2012). Even in the countries where EIA process is coordinated by a common legal framework such as European Union, the procedures vary among states, depending on how the environmental concepts are perceived by experts or stakeholders involved in the process (Glasson and Bellanger, 2003). Thus, the examination of the experts' perception is an important step in evaluating the efficiency and applicability of EIA procedures at the local, national, and European levels (Peterlin et al., 2008). Landscape perception and use by environmental planning actors was the subject of a number of studies and a common outcome was that stakeholders involvement in landscape analysis is required, which implies raising their awareness (Scott, 2011). Additionally, there are disagreements on the quality of landscape analysis conducted in the EIA procedure (e.g. Byron et al., 2000; Wood, 2008; Antonson, 2011). Several emerging studies on the use of landscape analysis in Environmental Impact Assessment processes, highlight the divergent treatment of the subject among experts, even at national level. As an example, Antonson (2011) and Henningsson et al. (2014) found a lack of a comprehensive understanding of the landscape as a shortcoming of the EIA process in Sweden.

To emphasize the national environmental policies that shape the perception of landscape concepts and its application in the Environmental Impact Assessment process, we contrasted experts' perception of these concepts and relevant EIA studies of two European Landscape Convention parties: Switzerland and Romania.

These two European countries demonstrate institutional differences: Switzerland being a federal country with independent administrative units (cantons) and well developed economy, conversely, Romania is a centralized state, a member of the European Union, with a communist past and an emerging economy (Tudor et al., 2014). Concerning landscape protection, Swiss authorities are implementing an environmentally friendly planning process when compared to other European countries (Hersperger and Bürgi, 2010), which makes it motivating to analyse in order to determine why the Swiss approach is so successful. By contrast, in Romania, landscape planning is deficient in planning policies and requires structural reform to be fully integrated into the EU policy system (Ministry of Development – Public Works and Housing, 2008; Tudor et al., 2014). Our study objectives are (a) to survey how the environmental experts from Switzerland and Romania perceive and define landscape, (b) to evaluate concepts and methods used in EIA reports to assess landscape characteristics and functions, and (c) to evaluate how the European Landscape Convention's aim and objectives are reflected by the environmental impact reports. The two contrasted countries have the potential to demonstrate the need of implementing a consistent landscape analysis with the European Landscape Convention intent and objectives.

## Methods

### Legal framework

Romania ratified the ELC in July 2002, being one of the first countries to apply this convention. Formerly, Romanian landscape related studies were predominantly theoretical and descriptive, frequently included in the physical-geographical studies (Pătru-Stupariu, 2011). Presently, landscape studies are connected with mainstream studies and related to quantitative analysis of spatial landscape patterns (e.g. Huzui et al., 2012), cultural landscape (e.g. Stoiculescu et al., 2014), or biodiversity conservation (e.g. Pătru-Stupariu et al., 2013).

ELC came into force in Switzerland in 2013. By contrast with Romania, Swiss landscape studies were connected to the mainstream studies addressing all dimension of the landscape (e.g. Bauer et al., 2009; Waltert et al., 2011; Sayer et al., 2013; Tobias and Müller-Wahl, 2013).

Landscape protection legal framework is well designed in Switzerland, with national and regional laws such as "Federal Law on the Protection of Nature and Landscape" (LPN, RS 451, 1 July 1966), and, at the canton's level, the "Spatial Planning Act" and the "Nature, Landscape and Heritage Protection Act". "Swiss Landscape Draft" and "Landscape 2020" are two policy documents framing landscape policy in Switzerland, while Romania is lacking similar rules (Depoorter, 2013). Within Romania, the only statutory law framing the landscape protection is the Environmental Protection Law (Dutu et al., 2003) which is a framework law for the environmental policy field.

Since 1986, in Switzerland, projects which might significantly affect the environment must provide an Environmental Impact Assessment report (OFEV, 2009). In Romania, the EIA report was introduced in 1990, the legislation being updated in 1997 and 2002 (Nistor et al., 2003).

In Switzerland and Romania, EIA procedures evaluate projects, plans, and ongoing activities impact on multiple environmental elements, among them: air, water, health, biodiversity, and soil (OFEV, 2009; Dutu et al., 2003). Based on assessed activity, the reports that are assessing the impact on the environment are: Environmental Impact Assessment (EIA) report for evaluation of projects, Environmental report (SEA) for evaluation of policies, plans and programmes and Environmental Balance (EB) for evaluation of

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